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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/880,715 | 06/12/2001 | Thomas L. Ritzdorf | SEMT117192 | 7384 |

7590 12/06/2005
Wallenstein, Wagner & Rockey Ltd.
311 South Wacker Drive, 53rd Floor
Chicago, IL 60606-6630

EXAMINER

LEADER, WILLIAM T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1742

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/880,715

Applicant(s)

RITZDORF ET AL.

Examiner

William T. Leader

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1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 54-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 54-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of the papers filed on September 21, 2005, is acknowledged. Claims 54-59 are pending.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 54-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin et al (US 5,972,192) or Poris (US 5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) for the reasons given in the previous office action and in view of the following comments.

4. Claims 54-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin et al (US 5,972,192) or Poris (US 5,256,274) in view of the Lowenheim text *Electroplating* and Ohmura et al (4,401,521) for the reasons given in the previous office action and in view of the following comments.

5. Applicant's Remarks have been carefully considered but are not deemed to be persuasive. At page 14 of the Remarks, applicant observes that Dubin and Poris fail to teach that the electrolytic process should be carried out in two stages, one with a low current density to initiate

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the plating operation and the second with a higher current density to completely fill trenches and holes on the surface of the wafer. Applicant notes that the Examiner relies on the secondary references, namely the Lowenheim text and the Ameen patent, for teaching of the concept of low current density initiation followed by higher current density for the bulk of the plating.

Applicant urges that the Lowenheim text is a general textbook, and is concerned with such plating operations as depositing an electrically conductive film onto a nonconductive surface such as plastic, and that the Ameen plastic is similar. Applicant concludes that there is no suggestion in the art to combine teaching of the secondary references with those of the primary references. This conclusion is considered to be incorrect. For the reasons given in the previous office action, the secondary references make clear the rationale for beginning a process of electroplating onto a substrate having a limited current carrying capacity at a low current density and subsequently increasing the current density. The advantages include the avoidance of burning the initially deposited seed layer by using a low current density at the beginning of the process, and the ability to shorten the time required to form the desired deposit thickness by increasing current density once the substrate has the ability to accept greater amounts of current.

6. At page 7 of the Remarks, applicant notes that the independent claims define conditions after which the higher current density is applied such as “after a combined thickness of the seed and plated layers has reached a predetermined value” and “after a predetermined time”. The claim limitation related to a predetermined value of thickness is considered to include all values of thickness after electroplating has begun, while the claim limitation related to “predetermined time” is considered to include all periods of time after the beginning of electroplating. The

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references of record suggest that electroplating current density should be increased after a period of time during which the current-carrying capacity of the seed layer has been increased. This teaching suggests the limitations referred to by applicant.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WL

William Leader
December 1, 2005

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700